

**CLAIMS**

1. An electromagnetic radiation absorber for absorbing radiation in the wavelength range  $\lambda_{\min}$  to  $\lambda_{\max}$  comprising a dielectric layer sandwiched between first and second conductor layers wherein the first conductor layer carries a plurality of apertures of sub-wavelength dimension and wherein the thickness of the absorber is less than  $\lambda_{\min}/4n$ , where  $n$  is the refractive index of the dielectric.
2. An electromagnetic radiation absorber for absorbing radiation in the wavelength range  $\lambda_{\min}$  to  $\lambda_{\max}$  comprising a conductor layer in contact with a dielectric layer wherein the conductor layer carries a plurality of apertures of sub-wavelength dimension and wherein the thickness of the absorber is less than  $\lambda_{\min}/4n$ , where  $n$  is the refractive index of the dielectric.
3. An e/m radiation absorber as claimed in claims 1 or 2 wherein the thickness of the material is less than  $\lambda_{\min}/10$ .
4. An e/m radiation absorber as claimed in any of claims 1 to 3 wherein the apertures are slit structures.
5. An e/m radiation absorber as claimed in claim 4 wherein the slit structures are periodic in nature.
6. An e/m radiation absorber as claimed in claim 4 or 5 wherein the slit structures are curved.
7. An e/m radiation absorber as claimed in claim 4 or 5 wherein the slit structures comprise a series of non-parallel slits.
8. An e/m radiation absorber as claimed in claim 4 or 5 wherein the slit structures comprise a parallel slit arrangement.
9. An e/m radiation absorber as claimed in claim 8 wherein the wavelength  $\lambda$  of radiation absorbed is determined by

$$\lambda \approx 2nG/N$$

- where  $\lambda$  is the wavelength in the range  $\lambda_{\min}$  to  $\lambda_{\max}$  where maximum absorption occurs,  $n$  is the refractive index of the dielectric,  $G$  is the spacing of the slits and  $N$  is an integer greater than or equal to 1.

10. An e/m radiation absorber as claimed in claim 4 or 5 wherein the slit structure comprises two orthogonal sets of parallel slits.
11. An e/m radiation absorber as claimed in any of claim 4 or 5 wherein the slit structures  
5 comprise three sets of parallel slits at 60 degree azimuthal separation.
12. An e/m radiation absorber as claimed in any of claims 4 to 11 wherein the slit width is less than 400 microns.
13. An e/m radiation absorber as claimed in claim 12 wherein the slit width is less than 50 microns.
- 10 14. An e/m radiation absorber as claimed in any preceding claim wherein the refractive index of the dielectric can be actively varied.
15. An adhesive tape comprising an e/m radiation absorber according to any preceding claim.
16. An automobile wherein a proportion of the surface of the automobile is covered in an  
15 e/m radiation absorber according to any of claims 1 to 13.
17. A panel covering for application to a building wherein the panel is covered in an e/m radiation absorber according to any of claims 1 to 13.
18. A heating element for use in a microwave comprising an e/m absorber as claimed in any of claims 1 to 13.
- 20 19. A tagging system comprising an e/m absorber as claimed in any of claims 1 to 13.